Solution by G. B. M. ZERR, A. M., Ph.D., The Temple College, Philadelphia, Pa., and J. E. SANDERS, Hackney, Ohio.

$$\frac{\$A+\$B}{1+p}=\frac{\$6300}{1.05}=\$6000=\text{cost of both farms.}$$

$$\$A+\$B-\frac{\$A+\$B}{1+p}=\frac{\$p(A+B)}{1+p}=\frac{\$6300\times.05}{1.05}=\$300=\text{gain.}$$

$$C+\frac{p(A+B)}{1+p}=\frac{C+p(A+B+C)}{1+p}=\$4000+\$300=\$4300=\text{cost of dearer farm.}$$

$$\frac{A+B}{1+p}-\frac{C+p(A+B+C)}{1+p}=\frac{(A+B)(1-p)}{1+p}-C=\$6000-\$4300=\$1700$$

$=$cost of cheaper farm.

Also solved in a similar manner and with same result by *G. W. GREENWOOD.*

ALGEBRA.

171. Proposed by IDA M. SCHOTTENFELTZ, A. M., New York, N. Y.

$ay^2+a=bxy+cx$, $bx^2+b=axy+cy$. Solve for x and y.

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

$ay^2+a=bxy+cx$....(1). $bx^2+b=axy+cy$....(2).

From (1), $x=a(y^2+1)/(by+c)$....(3).

(3) in (2) gives $[(a^2+b^2)y^2+2bcy+a^2+c^2](cy-b)=0$.

$$\therefore\ y=b/c,\ y=-\frac{1}{a^2+b^2}\{bc\mp a\sqrt{[-(a^2+b^2+c^2)]}\}.$$

$$x=a/c,\ x=-\frac{1}{a^2+b^2}\{ac\pm b\sqrt{[-(a^2+b^2+c^2)]}\}.$$

Also solved by *MARCUS BAKER.*

GEOMETRY.

103. Proposed by PROFESSOR BEYENS.

Si le rapport du segment d'une base de la sphère à l'hemisphère est m/n, le rapport de l'hauteur du segment à deux bases qui resultera au rayon est égal à $2\sin\frac{1}{3}[\sin^{-1}(n-m)/n]$. [Problem 9699, *Educational Times.*]

Solution by J. R. HITT, Goss, Miss.; G. B. M. ZERR, A. M., Ph. D., The Temple College, Philadelphia, Penn., and G. W. GREENWOOD, B. A., Professor of Mathematics and Astronomy, McKendree College, Lebanon, Ill.

Let R denote radius of sphere, h the altitude of segment of two bases, $R-h$=altitude of segment of one base. Then, $\pi(R-h)^2[R-\frac{1}{3}(R-h)]/\frac{2}{3}\pi R^3$